

Framework for Autonomous Optimization, Phase I

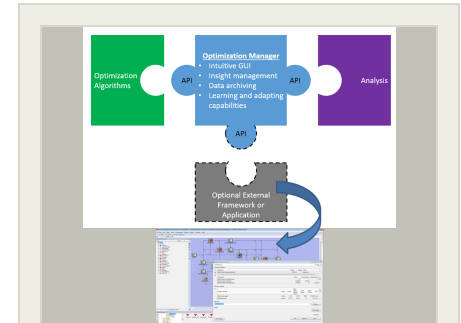
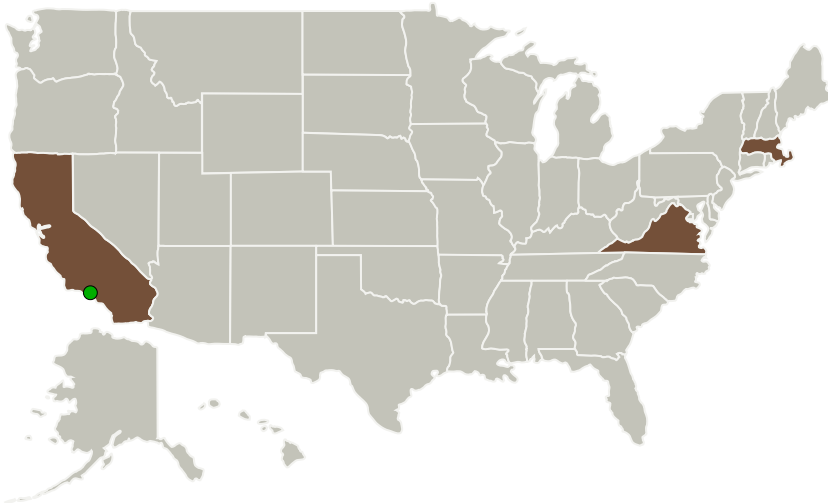
Completed Technology Project (2014 - 2014)



Project Introduction

Phoenix Integration and MIT propose to create a novel autonomous optimization tool and application programming interface (API). The API will demonstrate the ability to link to many optimization algorithms, both open source and proprietary, as well as to framework tools that carry optimization algorithms within them. It will also allow users to connect their engineering models to it conveniently. The API will be available both as a cross-platform standalone product and as part of ModelCenter, an engineering integration and trade study environment. In addition to and included within the API will be techniques to perform optimization autonomously by providing a management layer which globally adjusts the run in an intelligent fashion. Thus, it will categorize problems to understand effective solution techniques for them, try many algorithms during a run, change the settings on single algorithms so they run more productively, adaptively learn which techniques worked and which didn't, and inquire of the user insight that may help the optimizer reach its destination sooner. A database of prior runs will be built to help facilitate these features. The management layer will also help the user understand errors that take place, log appropriately, and prevent failures.

Primary U.S. Work Locations and Key Partners



Framework for Autonomous Optimization Project Image

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Organizations Performing Work	Role	Type	Location
Phoenix Integration	Lead Organization	Industry	Blacksburg, Virginia
● Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California
Massachusetts Institute of Technology(MIT)	Supporting Organization	Academia	Cambridge, Massachusetts

Primary U.S. Work Locations

California	Massachusetts
Virginia	

Project Transitions

**June 2014:** Project Start**December 2014:** Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/137668>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Phoenix Integration

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

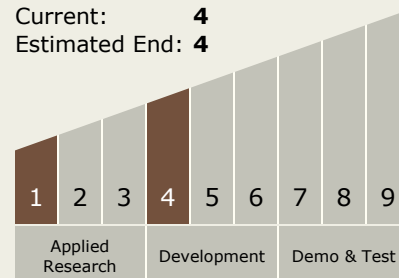
Program Manager:

Carlos Torrez

Principal Investigator:

Andy Ko

Technology Maturity (TRL)

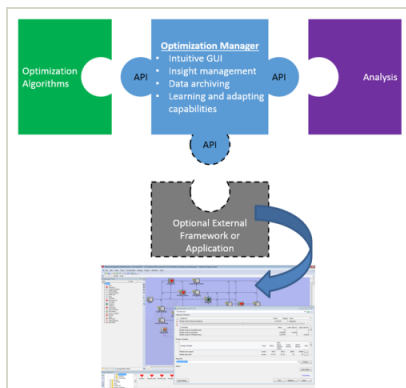
Start: **1**Current: **4**Estimated End: **4**

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Images



Project Image

Framework for Autonomous Optimization Project Image
(<https://techport.nasa.gov/image/132192>)

Technology Areas

Primary:

- TX04 Robotic Systems
 - └ TX04.6 Robotics Integration
 - └ TX04.6.3 Robot Software

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System